

SPiritUAL MESSAGE

For Those who Reason

**The Hardest thing to
Learn in life is which
bridge to cross and which to burn**



September 2003

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Spiritual Message (MONTHLY)

SUBSCRIPTION RATE

Single Copy : 15/-

Annual : Rs. 165/-

Abroad : One Year \$ 12 / £ 7 (Air Mail)

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Printed at Standard Print & Pack, Mumbai-99.

Tel.: 2825 6316 E-mail : standardp@vsnl.net

DISTRIBUTED IN ENGLAND BY

IPCI: ISLAMIC VISION

434, Coventry Road, Birmingham B 10 0JS

Tel. 0121-7730137, Fax: 0121-7668577

e-mail: info @ ipci-iv. Co.uk

Cheque should be issued in the name of
"Al-Risala"

Please send Rs. 50/- extra for outstation cheque

Words of Wisdom

Luqman admonished his son: "My son," he said, "do not associate others with God; to associate other with God is a mighty wrong." We have enjoined man to show kindness to his parents, for with much pain his mother bears him, and he is not weaned before he is two years of age. Give thanks to Me and to your parents. To Me all things shall return. But if they press you to associate others with Me, of whom you know nothing, then then do not obey them. Be kind to them in this world, but follow the way of him who turns to me. To me you shall return and I shall tell you what you have done. "My dear son, God will bring all things to light, be they as small as a grain of mustard seed, be they hidden inside a rock or in heaven or on earth. God is Wise and All-Knowing. My dear son, be steadfast in prayer, enjoin good and forbid evil. Endure with fortitude whatever befalls you. That is true constancy. Do not treat people with scorn, nor walk haughtily on the earth: God does not love the arrogant and the vainglorious. Rather let your gait be modest and your voice be low: the ugliest of all voices is the braying of the ass" (31:13-19).

Magnifying the Lord

You who are wrapped up in your vestment, arise and give warning, Magnify your Lord, purify your inner self. Keep away from all pollution. Be patient, for your Lord's sake. The day when the trumpet sounds should not be an easy one for the unbelievers: it shall be a day of anguish for them (74:1-10).

No, by the moon! By the departing night and the rising dawn, Hell is a dire scourge, a warning to mankind; alike to those of you who would advance and those who would hang back. Each soul is the hostage of its own deeds. But those on the right hand they will be in their gardens, inquiring of the sinners: "What brought you into the Fire?" They will reply: "We never prayed or fed the hungry. We engaged in vain disputes and denied the Day of Reckoning until death overtook us." No intercessor's plea shall avail them then (74:32-48).

Eternity is Better

Successful is the person who purifies himself, who remembers the name of his Lord, and prays. Yet you prefer this life, although the life to come is better and more lasting. All this is written in earlier scriptures: the scriptures of Abraham and Moses (87:14-19).

Their Efforts will be Rewarded

We have created man from a drop of thickened fluid so that We may test him. We made him a being endowed with hearing and sight. We have shown him the way, whether he be grateful or ungrateful. For the unbelievers We have prepared fetters and chains, and a blazing fire. But the righteous shall drink a cup flavoured with the Camphora spring at which the servants of God will refresh themselves as it gushes forth abundantly; they who keep their vows and dread the far-spread terrors of Judgement Day; who, though they hold it dear, give sustenance to the poor person, the orphan and the captive, saying: 'We feed you for God's sake alone; we seek of you neither recompense nor thanks; for we fear from Him a day of anguish and of woe.' God will deliver them from the evil of that day, and will make their faces shine with joy. He will reward them for their steadfastness with robes of silk and the delights of Paradise. Reclining there upon soft couches,

they shall feel neither the scorching heat nor the biting cold. Trees will spread their shade around them, and fruit will hang in clusters over them. They shall be served with silver dishes, and beakers as large as goblets; silver goblets which they themselves shall measure; and cups brimful with ginger-flavoured water from the Fount of Selsabil. They shall be attended by boys graced with eternal youth, who, to the beholder's eyes will seem like sprinkled pearls. When you gaze upon that scene you will behold a kingdom blissful and glorious. They shall be arrayed in garments of fine green silk and rich brocade, and adorned with bracelets of silver. Their Lord will give them pure nectar to drink. Thus you shall be rewarded; since your endeavours in life shall be pleasing to God. (76:2-22).

The Day of Reward and Retribution

When the sky is cleft asunder; when the stars scatter and the oceans burst beyond their bounds; when the graves are overturned; each soul will know what it has sent ahead and it has left behind. O man! What evil has enticed you away from your gracious Lord who created you, gave you an upright form, and well-proportioned you? In whatever shape He willed, He moulded you. Yet, you deny the Last Judgement. Surely there are guardians watching over you, noble recorders who know of all your actions. The righteous shall surely dwell in Bliss. But the wicked shall burn in a blazing fire on the Judgement-Day; which they shall not be able to evade. Would that you knew what the Day of Judgement is! Oh, would that you knew what the Day of Judgement is! A Day when no soul shall be of the least avail to another soul; for on that Day all sovereignty is God's alone (82:1-19).

The Religion that is Pleasing to God

As for the home of the world to come. We shall grant it to those who seek neither to exalt themselves in this world nor to spread corruption. The righteous shall have a blessed end. Whoever does good shall be rewarded with what is better. But those who do evil shall be requited only according to what they did (28:83-84).

As for him who rebelled, and preferred the life of this world; Hell shall be his Final Abode. But as for him who feared to stand before his Lord and restrained his soul from base desires; Paradise shall be his Final Abode (79:37-41).

He that chooses a religion other than Islam, it will not be accepted from him and in the world to come he will be one of the lost (3:85).

Progress End Feminism

In Japan about 15 million women are employed in outside-their homes-jobs in offices and factories. Far from enjoying an equal position with their male counterparts, they serve as helpers and subordinates.

Two Japanese women have recently been elected to the cabinet, but only thanks to Women's Year which will come to an end in 1985. Of the 608 diplomats in Japan, only twelve are women. Even to this day Japan's society is basically a male-dominated one. This is what the present woman minister said in the report:

"A bill, yet to be passed by the parliament, on ending discrimination against women, is considered by many of its male critics as reverse discriminatory."

Those who subscribe to the view that a nation will fail to march ahead without the participation of women who constitute almost half of the population need to make a reappraisal of their ideas. There is no doubt about it that Japan is rated as one of the most developed nations of the modern world, but all its developments have taken place without women's involvement as equals in non-domestic activities.

In olden times the spheres of men's and women's activities were considered separate. In modern times, however, this demarcation has been cast aside, and the argument put forward that a nation cannot progress if women are not offered equal opportunities to share in the building of it. But the experiment of giving women a free hand has shown that the abolition of the ancient system of the division of labour has not contributed to progress to any significant degree. In the countries where women have already been offered equal opportunities in every field, even there, in practice, all important, advanced fields are dominated by men.

Japan's example has challenged the feminist view. Japan, in every sense of the word, is a developed country of the modern world, but its society is still male-dominated like those of ancient times. This proves that the development of a nation does not depend upon equal participation of women, as is held by militant feminists of the world

Truth at All Costs

An American statesman, scientist and writer, Benjamin Franklin (1707-90), was known in his childhood to be a tactless fellow, yet in later years rose to the coveted post of ambassadorship, being appointed ambassador of America to France. His secret of success lay in his own words:

"I'll speak ill of no man, and speak all the good I know of everybody."

Man indeed loves nothing more than being praised and hates nothing more than being criticized.

A man of principle, however, upholds the truth, no matter what price has to be paid. In doing so he can become an object of scorn, or be treated as an outcast from society. But an unscrupulous person draws the crowd. The reason is quite simple. The former abides by the truth, at all costs. He does not mould himself to the wishes of the people, while, to the latter, it is expediency alone which counts. His aim is to earn the good will of the people so he moulds himself into what they want him to be.

To pass on to others something one does not believe in; to present falsehood as truth for the sake of consolidating one's hold on people amounts to hypocrisy. One so inclined is very likely to achieve success in this world, but will be cast aside in the next world, where truth and untruth will become as clearly separated from each other as day is from night.

There is a great difference between a preacher, the ambassador of God, and an ambassador who is appointed by worldly governments. The former himself sets out to please God while the latter is appointed to please the people. The latter sets his eyes on expediency, on worldly

Uncomplaining Endurance

The Mughal prince, Aurangzeb, came into conflict with his father, Shahjahan, over certain political matters. He, therefore, dethroned Shahjahan and imprisoned him in the fort at Agra in 1658, where he was kept in close confinement and deprived of even the common necessities of life. He could only while away his time by contemplating the Taj Mahal from the fort and reciting poems.

"An Advanced History of India," compiled by Dr. R.C. Majumdar, Dr. H.C. Raychaudhuri and Dr. Kalinkar Dutta describes the final days of Shahjahan in these words:

"He found solace in religion, and, in a spirit of resignation, passed his last days in prayer and meditation in the company of his pious daughter, Jahanara, till at last death... relieved him of all his miseries (P. 477).

It is said that Shahjahan, weary of this life of confinement, conveyed to the Aurangzeb this message in the form of a verse:

'Kill us or pay us or set us free.

Aurangzeb sent another verse in reply:

'When the wise bird is caught in a net it should remain patient.

This might be a fiction rather than fact. There is, however, a lesson to be learnt from this. Sometimes, by accident, or due to some mistake one is enmeshed in circumstances which are unbearable and from which it is not possible to extricate itself. It is foolish in such situations to take action on impulse without considering the consequences. Just as when a bird is caught in a net, the more it flutters its wings, the more it enmeshes itself. Likewise, when in such a situation, if one loses patience, one becomes more and more entangled. This is true both for individual and for nations.

Death the Leveller

An Air India plane, a Boeing 747, took off from Montreal on 23 June 1985, carrying 329 people aboard including the crew. It was bound for Delhi via London.

At Palam airport, Delhi, large numbers of people were waiting, as usual, to receive their relatives and friends. Some of the passengers were coming back home after working hard at their studies or their business. There were some girls and boys who were coming to India to get married. Still others were to visit their homeland after a long interval to meet their near and dear ones.

Their happiness, however, suddenly turned into deep grief. While flying above the Atlantic, the plane met with an accident and plunged into the ocean off the coast of Ireland. When the list of the dead was put up on the board the people waiting for them rushed towards it. At this moment, a reporter of the Hindustan Times (24 June 1985) captures the scene in these words:

"In their moment of stunned disbelief, each thought 'this could not be happening to me.' But with merciless equality the death list shattered all their hopes."

Leaving aside such major tragedies, it is a fact of life that every day a number of people pass away from this world in the ordinary course of events. This fact on its own should be enough to shake people up, but it does not, for the simple reason that everyone who watches others disappear thinks that this fate is only destined for others, and not for himself. This is a strange but observable fact of human psychology. By excluding himself he fails to learn a valuable lesson. He fails to hear the message of death even when it is close at hand.

Quranic Connection

Imam Shafii (150-204AH) is remembered as the founder of the principles of Islamic jurisprudence. Besides being a great scholar, he also excelled in piety. Imam Ahmad Ibn Hambal had this to say about him. "I do not know anyone who had such a strong affiliation with Islam as Imam Shafii."

Imam Shafii had learnt the whole of the Qur'an off by heart by the time he was ten years old. He used to recite the Book of God from cover to cover every three days. His attachment to the Qur'an was such that he used to seek out the root of every matter in the Qur'an, not resting content until a point had been proved from

the Book of God itself.

All jurists are agreed that consensus of the Muslim community is a valid theological proof. Imam Shafi was keen to establish its validity from the Book of God. He read the Qur'an over and over again, searching for a verse which would illustrate this point.

Imam Shafii read the Qur'an 301 times before he finally found a verse which established conclusively the validity of consensus as a theological proof. He was reading through the Qur'an one day when he reached the one-hundredth and fifteenth verse of the fourth chapter (An-Nisa'a). He realized that the verse he was reading provided proof of the fact that Muslim consensus was a valid basis for theological verdicts. The verse was:

"He that disobeys the Apostle after guidance has been made clear to him and follows a path other than that of the faithful, shall be given what he has chosen. We shall cast him into hell: a dismal end."

Reading this verse, Imam Shafii realized that by the "path of the faithful" was meant what was commonly known as consensus.

Early Muslims used to try to ascertain every matter from the Qur'an, even if it meant reading the Book of God over time and time again. They would not rest content until they found out what the Qur'an said on a certain matter. How far removed their approach was from that of latter-day Muslims. Certainly, the latter view the Qur'an as a "holy book", a source of blessing and grace. As for making its teachings a practical part of one's everyday life, and referring to it for guidance in one's spiritual and worldly affairs in this respect they are sadly lacking.

The Spiritual Versus the Material

An international technological exhibition was held in New Delhi in 1961, in which a large number of countries participated. The American pavilion became the centre of people's attention, drawing the crowds away from other pavilions because it had an air motor car on display.

The visitors, (myself included) gathered on a field to watch the spectacle. The driver first drove it on the ground like an ordinary car, then raised it: about 4 feet above the ground, circled the field several times, then brought it down on to the ground again.

It was explained to us that such cars drew air from above and released it at high pressure: below the car, thus building an air pad between the car and the ground over which it could glide like a boat sailing on water.

Among the visitors there was a young Sadhu. Clad in saffron clothes, his long, tangled hair falling into curls and knots, he kept gazing at the car with rapt attention for about 20 minutes. Seeing his state of absorption, a newspaper reporter approached him to ask what his impressions were of this air car. The Sadhu replied quite seriously "After watching this air motor car, I am faced with a new problem, that is, whether or not I should forsake the spiritual life for the material, and thus fulfill my ambitions by way of material achievements. This exhibition has caused me to have second thoughts about which of the worlds, spiritual or material, it is better to be attached to. (The Hindustan Times, 20 November, 1961)

Such events as this seem to show a contradiction between scientific and spiritual development. It would appear that the one can be gained only at the cost of the other. But it entirely depends on what one's interpretation of spiritual is. If being spiritual means forsaking the world altogether and taking to jungles and mountains, renouncing all contact whatsoever with the world, the scientific and spiritual appear to contradict each other.

But we find no clash between the two, if we regard the spiritual life as one in which one purifies one's self, body and soul of base motives. In this way being spiritual means only to rectify one's relationship with other human beings and is far from meaning the renunciation of all contacts with the material world.

The spiritual is by no means the opposite of the scientific; it is actually the opposite of the material. Because a spiritual person is not materially minded, it does not mean that he cannot think scientifically. One who is spiritually inclined resorts constantly to his inner mental life something which no one can take away from him. Such a man possesses inner contentment, and is far above all material gain and loss. Inner peace is something which he holds dearer than anything else, for he need look no further than his own inner resources for his satisfaction in life.



GOD ARISES

A book by Maulana Wahiduddin Khan in serials.

IV

Nature and Science Speak about God

The greatest evidence of God before us is His creation. Nature itself and our study of nature, both proclaim the fact that there is one God who, in the infinity of His wisdom, has created and continues to sustain this universe. By ignoring or rejecting this truth, we plunge ourselves into an abyss of murky incomprehension and its attendant evils.

The very existence of the universe, with its superb organization and immeasurable meaningfulness, is inexplicable except as having been brought into existence by a Creator -a Being with an infinite intelligence -rather than by a blind force.

Among the philosophers of our time, there is a group, perhaps fortunately a small one, which doubts the very existence of every thing, no matter what it may be. It asserts that there exists neither man nor universe. In its nihilism, it likewise rejects the existence of God, even as a remote possibility.

As far as this particular brand of agnosticism is concerned, this may be a philosophical point worth considering purely as an abstract exercise in logic, but it is in no way connected with reality. When we think, the very act of thinking gives evidence of our existence. The great French philosopher and mathematician, Descartes, (1596-1660) founded his philosophy on the precept: "I think, therefore, I am."¹ And from this point, he went on to deduce the existence of God. Our sensory perceptions too give us clear indications of the external existence of material things. If, for example, while walking along the road, we are hit by a stone, we feel pain. This experience establishes that, apart from us and outside of us, there exists a world having its own separate identity.

In fact, our minds, through our senses, perceive innumerable objects and register countless sensations and impressions every moment of our waking existence. These acts of cognition are personal "experiences which continually reinforce the concept of the world having its own existence. Now, if the philosophical inclinations of a particular individual make him sceptical about the existence of the universe, this is an exceptional case, bearing no relation to the experiences of millions of human beings. It is simply that such an individual is so engrossed in his own private predilections that he has become deaf and blind to common realities. For the sake of argument, he would have us concede his point, but this would in no way imply that God did not exist. The absurdity of arguments against the-existence of commonly accepted things is so patent as to be hardly worth comment. And quite apart from being incomprehensible to the common man, they could never gain credence in the world of learning.

Outside the nihilist group, the existence of the universe is accepted as a reality: the moment we admit its existence, we find belief in God inescapable, because the notion of creation having arisen spontaneously out of nothing is quite inconceivable. When everything big or small, has a cause, how can it be believed that such a vast universe has come into existence on its own, and that it has no Creator? In his autobiography, John Stuart Mill, observed that his father had impressed upon him from the first, that the manner in which the world came into existence was a subject on which nothing was

known: that the question "Who made me?" cannot be answered, because we have no experience or authentic information from which to answer it, and that any answer only throws the difficulty a step further back, since the question

immediately presents itself, "Who made God?"²

This is an old argument much relied upon by atheists, its implication being that if we do accept that there is a Creator of the universe, we shall be compelled to accept this Creator as being eternal. And when God has to be regarded as eternal, why should not the universe itself be regarded as eternal instead? Although such a conclusion is absolutely meaningless -because no such attribute of the universe has come to light so far to justify the conclusion that the universe has come into existence of its own accord -up till the nineteenth century, this misleading argument of the atheists was regarded as the most attractive one. But now, with the discovery of the second law of the thermodynamics, this argument has lost its validity. Thermodynamics is a branch of science which deals with energy transformation. In particular, it shows the quantitative relations between heat and other forms of energy. The importance of conservation in relation to energy, is expressed in the first law of thermodynamics.

The Law of Entropy is the second law of thermodynamics. To understand it, let us take the example of a metallic bar which has been heated at one end but left cold at the other. Heat will instantly begin to flow from the hot end along the length of the bar to the cold end, and will continue to do so until the temperature of the whole bar becomes uniform. The flow of heat will always be in one direction, i.e. from warmer to colder bodies and this flow will never pass spontaneously in the opposite direction, or even haphazardly in just any direction. Other examples of such uniform and non-reversible processes abound in the physical world. For instance, gas always flows towards a vacuum or moves from a point of higher pressure towards that of a lower pressure till its pressure becomes uniform. It is impossible for any gas to flow in the reverse direction. Such observations provide the basis for the second law of thermodynamics. This law may be stated as follows : All natural or spontaneous processes occurring without the intervention of an external agency are irreversible. The process of one-way movement goes on till a state of equilibrium is reached. On the relevance of these laws to creation, Edward Luther Kessel, an American zoologist/writes:

Science clearly shows that the universe could not have existed from all eternity. The law of entropy states that there is a continuous flow of heat from warmer to colder bodies, and that this flow cannot be reversed to pass spontaneously in the opposite direction. Entropy is the ratio of unavailable to available energy, so that it may be said that the entropy of the universe is always increasing. Therefore the universe is headed for a time when the temperature will be universally uniform and there will "be no more useful energy.

Consequently there will be no more chemical and physical processes, and life itself will cease to exist. But **because life** is still going on, and chemical and physical processes are still in progress, it is evident that our universe could not have existed from eternity, else it would have long since run out of useful energy and ground to a halt. Therefore, quite unintentionally, science proves that our universe had a beginning. And in so doing it proves the reality of God, for whatever had a beginning did not begin of itself but demands a Prime Mover, a Creator, a God!³ James Jeans has expressed the same view :

The more orthodox scientific view is that the entropy of the universe must forever increase to its final maximum value. It has not yet reached this: we should not be thinking about it if it had. It is still increasing rapidly, and so must have had a beginning; there must have been what we may describe as

a 'creation' at a time not infinitely remote.⁴

There is much physical evidence of this type to prove that the universe has not always existed. On the contrary, its life-span is limited. According to astronomy, the universe is in a state of continuous expansion outwards from the centre of its origin. All of the galaxies and celestial bodies are observably moving away from one another at enormous speeds. This phenomenon can be satisfactorily explained if we presume an initial point of time when all these constituents were an integrated whole, and the release of energy and the process of movement were subsequent developments.

On the basis of different observations of a similar type, it is generally held that the universe originated about 5 billion years ago. In theory, the entire universe was formed by an extraordinary explosion from a state of high density and high temperature. This has come to be known as the 'big-bang' theory. To accept that the universe has a limited life-span, and at the same time to deny its having an originator is like accepting that the Taj Mahal has not existed for all eternity, (it having been built some time in the middle of seventeenth century) while denying the existence of an architect or builder, and asserting, on the contrary, that it simply mushroomed all by itself on a particular date.

Studies in astronomy show that the number of stars in the sky is as numerous as all of the sand grains on all the sea-shores of our planet, many of the stars being vastly greater in size than our earth, some even being of such enormous girth that they could accommodate hundreds of thousands of earths inside them and still have room to spare. A few of them are even big enough to contain millions and millions of earths. The universe is so vast that an aeroplane flying at the greatest speed imaginable, i.e. at the speed of light, (186,282 miles per second) would take about ten billion years to complete just a single trip around the whole universe. Even with such a huge circumference, this universe is not static, but is expanding every moment in all directions. So rapid is this expansion that, according to an estimate by Eddington,⁵ every 1300 million years, all the distances in this universe are doubled. This means that even our Imaginary aeroplane travelling at the speed of light would not ever be able to fly all the way around the universe, because it would never be able to catch up with this unending expansion. This estimation of the vastness of the universe is based on Einstein's theory of relativity. But this is just a mathematician's guess. To tell the truth, man has yet to comprehend the vastness of the universe.

In a clear sky which is free of dust, five thousand stars can be seen with the naked eye. With the help of an ordinary telescope this figure is increased to 2 million and through great 200-inch telescope on Mount Palomar in America, billions of stars are visible. But even this figure is small as compared with the actual figure. The universe is an infinitely vast space in which innumerable stars are continuously moving at extraordinary speeds. Some stars are moving singly, some in groups of two or more, while innumerable stars are grouped in constellations. You may have noticed myriads of dust particles swirling around in the rays of light penetrating a room through some aperture. If you can visualize this same scene on a colossal scale, you will have a rough idea of the revolutions of the stars throughout the universe. The only difference is that dust particles can collide and move in combination whereas the stars, notwithstanding their enormous numbers are at immeasurable distances from each other and follow their respective courses, like ships sailing hundreds of miles apart in the vastness of the oceans. The whole universe is made of countless constellations, or galaxies, all of which are in perpetual motion.

The nearest example of such motion is the moon's circling of the earth at a distance of 240,000 miles. It completes each revolution in 29 1/2 days. Similarly, our earth, at a distance of 95 million miles from sun, rotates on its axis at a thousand miles an hour, and "takes one full year to go around the sun. Besides the earth, there are in the solar system eight other planets, all of which are continuously revolving

around the sun. Pluto is the farthest away of all, with an orbit of 75 million miles. All these planets move on their individual paths with thirty one moons in orbit around their respective planets simultaneously. In addition to these nine planets and thirty one moons, a group of thirty thousand asteroids, thousands of comets and innumerable meteors also remain perpetually in orbit. The central place among them is, of course, occupied by our Sun, which is also a star. Its diameter is 865,000 miles. That is, it is twelve lakh times larger than the earth. The sun itself is not stationary, but is revolving along with all its planets and asteroids at a speed of 600,000 miles per hour. Within a vast galactic system, there are thousands of such mobile systems which combine to form a galaxy. A galaxy is like a huge plate upon which countless stars are in continuous revolution, singly as well as in groups, just like so many spinning tops. These galaxies themselves are, in turn, in continuous motion. The nearest galaxy, in which our solar system is situated, is rotating on its own axis in such a way that it concludes a single rotation within a period of 200 million years.

Astronomers estimate that the universe consists of five hundred million galaxies. Each galaxy contains about 100,000 stars. The nearest galaxy, the Milky way, which is partially visible at night, has an area of 100,000 light years. And we, the inhabitants of the earth, are thirty thousand light years away from the centre of this galaxy. This galaxy in turn forms part of an even larger super-galaxy within which seventeen galaxies similar to our own are in perpetual motion. The diameter of this entire cluster is 2 million light years.

Over and above all these revolutions, another kind of movement is going on, i.e. the whole universe is expanding in all directions just like a balloon. Rotating with an incredible rapidity, at a speed of 12 miles per second, our own Sun is continuously whirling away towards the outer margin of its galaxy, carrying all the members of the solar system with it. Similarly, in perpetual rotation, all the stars are moving away in one direction or the other at tremendous - speeds - some at eight, some at 33 and some at 84 miles per second.

The amazing part is that all of this motion is going on with a remarkable organization and regularity. Neither do the stars collide, nor does their speed alter. The rotation of our earth around the sun is a model of regularity. Likewise, its rotation on its own axis is so precise in timing that there has not been a discrepancy of even a second over the centuries. The moon, the earth's satellite, similarly hardly strays from its orbit by so much as a hair's breadth, there being only a minuscule deviation in its course which is repeated with clock-work precision every eighteen and a half years. The other celestial bodies spread throughout the universe function with a similar degree of precision.

According to astronomical calculations, it has frequently happened that entire galactic systems consisting of millions and millions of moving stars have entered other galactic systems and have passed right through them without any collisions having taken place. In the face of such astonishing organization, the human intellect is left with no option but to accept that this is no self-organized system. On the contrary, there must be some unique Power that has set up, and is maintaining such a boundless and infinitely varied system.

This very organization and discipline that is found among the macrosystems is also extant in microsystems. According to the latest research, an atom is the smallest of all the known 'worlds' being too small to be observed even by the most powerful of microscope. (A recently developed one is capable of magnifying an object one hundred thousand times). As far as the optical range of a human being is concerned, an atom is non-existent. But astonishingly, within such an infinitesimal particle, there exists

(according to the Bohr Theory) a revolving system just like our solar system. This consists of a positively charged central core, the nucleus, surrounded by one or more negatively charged planetary electrons. Between these there are surprisingly huge gaps. Even in a substance of great density, like a piece of lead, in which one might expect the atomic particles to be rigidly compressed, the electrically charged particles occupy barely one out of a thousand million parts of the volume, and the remaining portion is vacant. The revolution of the electrons around the nucleus is so swift as to be undetectable at any given point. On the contrary, they appear to be omnipresent in their orbit, making, as they do, a thousand billion rounds within a single second.

If science can suppose the existence of a barely comprehensible and totally unobservable organization simply because, without such a supposition, the mechanism of an atom cannot be explained, why should not the same logic apply to the supposition that there is an organizer without whom no organization is possible within the atom?

Now let us turn to human biology to see how the different parts of the human body perform vital and highly complex functions in perfect coordination with one another.

The Brain is the central office which controls, directs and coordinates the varied activities of all the innumerable organs of the body. It receives messages from each of the senses, interprets them, sends the proper replies to the organs concerned so that the body reacts appropriately (jumps out of the way, of approaching car, for instance), and registers all the information received in the archives of the memory. Think of a huge telephone exchange in continual contact with every man, woman and child on earth, sending and receiving messages to and from each one every few seconds -and you have a faint idea of the incredibly complex organization of the brain.

In the white and grey matter of the brain there are nearly a thousand million nerve cells, each of which is, by turns, an electric battery and a small telegraph transmitter. Each cell branches out into a number of fine conducting threads, the nerve fibres, which extend to all parts of the body. A large number of them run down the hollow back-bone, twisted together into a thick cable, the spinal cord, admirably protected by the bony and well-cushioned walls of the spine. Through these tiny threads, each of which is covered with an insulating sheath, a current flows at the speed of about 70 m.p.h., carrying messages to and from the brain, with marvelous speed and accuracy. There is an elaborate system of relays, condensers, switches, etc., which permits the transmission of the most unexpected messages between the brain and each of the millions of cells it controls, without the least confusion or delay.

The most complicated radio station, the most up-to-date telephone exchange is like a tin of sardines compared to the incredibly elaborate maze of the nerve system of the brain.

The Ear : Long before man discovered wireless, the ear knew all that was to be known about the reception of sound waves. The human ear consists of a funnel beautifully adapted to pick up sounds and equipped with fleshy folds which enable it to perceive the direction from which the sounds come. Inside the ear, fine hairs and a sticky wax prevent harmful insects, dust, etc. from getting in. Across the inner end of the funnel there is a tightly stretched membrane, the ear-drum, which vibrates like the skin of a tabla when sound waves strike it. The vibrations are passed on and amplified by three bones (called the hammer, the stirrup and the anvil) whose relative sizes are precisely adjusted to produce just the needed amplification. Indeed these bones never grow: they are of exactly the same size in the infant and in the adult.

The amplified vibrations are carried by the bones to another membrane just beyond which lies the wonderful organ of hearing, the inner ear. This is a small tube (the cochlea) coiled up like the shell of a snail, and filled with a liquid in which a harp of 6,000 strings hanging in length from $1/2$ th to $1/2$ mm. hangs suspended. Each string vibrates to a particular frequency of sound so that the ear can hear all possible combinations of 6,000 different sounds. The vibration of the strings are transmitted to 18,000 nerve cells whose fibres communicate with the brain.

The Eye : is the world's most efficient television station: it takes flawless pictures in colour and transmits them without the least blurring to the brain. It takes a photographer to appreciate fully the working of the eye. Like any camera it is a small dark box, with an aperture in front fitted with a transparent pane. In front of the pane there is a shutter of variable speed, (the iris) with an adjustable slit and automatic release. Behind, there is the crystalline lense whose curvature is continually adjusted by automatic muscles so that whatever is looked at is always sharply in focus. Six large powerful muscles control the movements of the eye and point it in any desired direction.

The delicate parts of this precision instrument are kept clean by the eyelids which are window-wipers and use a cleaning fluid secreted by the gland at the corner of the eye and poured in through a siphon. A constant temperature is maintained, as in any laboratory with highly sensitive apparatus, by means of a heat regulating membrane, the choroid. The photographic plate of the eye is a small screen at the back, the retina, on to which the images of the things we see are focussed. The retina can take 10. different pictures each second or 800,000 pictures a day, wiping itself clean after each. It is so 'fast' that 30,000 separate points of light can be recorded by a single square millimeter (the size of a nail head) of its surface. All the pictures are in vivid colour, with sharp outlines, and delicate shading; they are, besides, movies and in 3-dimensions, thanks to the stereoscopic focus of the two eyes.

The Heart : is a small organ, about the size of the fist, (4 inches long and $2\frac{1}{2}$ inches broad), weighing not much more than eight ounces, yet this small pump can work prodigiously. It keeps on pumping day and night for a whole life-time without the least pause, rating some 100,000 strokes a day and sending about a gallon of blood circulating through the body once every 13 seconds. In a single day the heart pumps enough blood to fill a good-sized oil truck; in a single year it could fill a train of 65 large oil wagons.

The heart is specially built for the immense job it has to do. Its walls are made up of very tough muscular fibres, and it is surrounded by a double membrane (the pericardium) containing a fluid which lubricates its continual movement. The beat of the heart takes place in two steps as first the upper and then the lower half contracts. This enables each half of the heart to rest while the other is beating. Inside, the heart is divided into 4 chambers, two upper chambers called the auricles and two lower chambers called the ventricles. Blood always flows from the auricles to the ventricles, and this one way traffic is maintained by umbrella-shaped valves which guard the openings between the two sets of chambers.

Digestion : The digestive system can be looked upon as a factory where food is tasted by the tongue, then crushed by the teeth, moistened with saliva and finally, -after elaborate precautions to avoid shunting mistakes,-is pushed through the gullet into the stomach, a chemical plant where the most astonishing changes occur. Here millions of cells, too small to be seen, produce a dozen highly complex chemicals which break up the food we have eaten, whether it be meat, spinach, or rice, or cheese, into simpler substances which can be absorbed by the cells of our body and built up into our flesh and bone. The chemical changes that take place are truly marvellous -well beyond the capacity of the best equipped of our laboratories. And there are five million of these little chemical units in the stomach, some forty

million in the intestines, and more than three and a half billion in the liver. They produce, not only the chemicals needed to digest our food, where and when required, but also effective remedies against diseases like cholera and dysentery. At the same time the liver manufactures substances which help the body to burn some of the food we have eaten to provide the heat and energy every living being needs. The digestive system is not only a chemical factory, but a power house as well.

The Lungs : These are organs which bring the blood into contact with clean fresh air -for they knew, long before we ourselves were aware of the fact, that to purify the blood nothing is better than a good bath of oxygen.

At each breath, air is drawn into more than 1,500,000 little air-sacs in the lungs, which if spread out would cover an area of some 200 square yards -:- the size of a nice little vegetable plot. These little balloon-like sacs are made of a thin elastic tissue which allows air to pass through but prevents blood from oozing in.

The blood is carried to the lungs through 50,000,000,000 tiny hairthin tubes which form a close network all along the outside of the little balloons of the lungs. Each day they bring in some 10,000 litres of blood. Oxygen is sucked in by the red blood cells, while waste products of the body like carbon dioxide and water are given up by the blood, pass into the little air sacs, and are breathed out.

As long as a child is in the womb of its mother its lungs do not function, and the flow of blood is turned away from the lungs by means of a special little door in the heart. As soon as it is born, the baby, who is on the verge of suffocation, utters a loud cry. The cry produces a whole series of wonderful changes. The great bags of the lungs open and air rushes in to fill them. A great flow of blood is drawn into the lungs which like a violent draught of air slams shut the little door inside the heart which had hitherto turned the blood away.

The Skin : with its vast network of sensitive fibres spread over the body's surface is equally fascinating. The moment a hot object comes in contact with our skin, or even comes close to it, about thirty thousand hot cells feel it, and instantly report it to the brain. Similarly, there are 250,000 "cold cells" within our skin which crowd the brain with messages as soon as contact is made with a cold object. The body then begins to shiver and veins in the skin become dilated in order to make up for the loss of warmth in the body. When intense heat is "reported" to the brain, three million perspiratory glands are activated to release the cool fluid we recognise as perspiration. The nervous system is divided into different parts, one of them being the autonomic branch, which deals with reflex functions that are performed within our body, such as digestion, respiration, heart beats and so on. This autonomic branch is further subdivided into two systems: the sympathetic system, which causes activity and the parasympathetic system, which serves as a brake. If our body were under the exclusive control of the sympathetic system, the heart would beat so rapidly that death would result. And if our body were left to the mercy of the parasympathetic system, the beating of our heart would be totally arrested. Both these systems function in perfect co-ordination with each other. Whenever our body is exposed to excessive stress and strain, causing a sudden need for extra strength to withstand it, the sympathetic system dominates, making the lungs function more rapidly, and pumping adrenal into the system from which the body may derive extra energy. But while we are asleep, the parasympathetic system has the upper hand, anaesthetizing all our bodily activities.

Throughout the universe there are countless examples of such superb organization, far surpassing even the most advanced systems of man-made machines. The imitation of nature has latterly begun to be

treated as a regular object of scientific enquiry. Until very recently the scope of science was confined to the discovery of unknown forces in nature, and their practical applications. But now the study of various organic systems of nature is receiving special attention in scientific spheres. This branch of science is called bionics.. It seeks to understand how nature functions, transmitting nature's patterns into mechanical form, in order to solve the myriad problems which arise in the field of engineering.

Such imitations of natural systems in the field of technology is well illustrated by the camera, which is, in fact, a mechanical reproduction of the function of the eye. The lens, the diaphragm and the photosensitive film correspond respectively to the outer layer of the eyeball, the iris and the retina. No one in his right mind would claim that a camera had come into existence accidentally, but there are a good number of intellectuals in this world who believe that an eye came into existence by the merest chance.

At the Moscow University, a device has been developed for the detection and measurement of infrasonic vibrations. It is five times more powerful than conventional apparatus, being able to detect and report the approach of a storm twelve to fifteen hours in advance. What was it which provided the pattern? Credit must go to the humble jellyfish whose organs are highly sensitive to infrasonic vibrations. Engineers simply imitated them. Similarly radar, a device of prime importance in defence technology, is a mechanical copy of the bat's use of sonic waves to compensate for its blindness.

These are but a few of the many examples. Physical science and technology have, in fact, received hints from nature on innumerable occasions for the development of novel concepts; so many problems that still remain an enigma to scientists have often been solved by nature long before. Yet, but for the human mind, the camera and the teleprinter system could not have come into existence. It is even more unthinkable that the formidably complicated system of the universe could have come into existence without there having been a creative intelligence behind it. There is something quite irrational in refusing to believe in an organizer of an organized universe. The human mind has, indeed, no rational grounds for denying the existence of God.

The universe is not just a heap of garbage. Quite the contrary. It is invested with a profound significance. This fact explicitly shows that some Mind is at work behind the creation and sustenance of the universe. It is impossible for anything to be as meaningful as the universe is without an intellectual planning behind it. A universe coming into existence by a blind, materialistic process could never evince such sequence, order and meaningfulness. The universe is such a wonderfully balanced organization that it is quite inconceivable that the order and balance could have come about accidentally. In his book *Man Does Not Stand Alone* A. Cressy Morrison points out that :

So many essential conditions are necessary for life to exist on our earth that it is mathematically impossible that all of them could exist in proper relationship by chance on any earth at one time. Therefore, there must be in nature some form of intelligent direction. If this be true, then there must be a purpose. In support of this view, we reproduce below a paper on this subject written by Frank Allen, a prominent biophysicist whose specializations are colour vision, physiological optics, liquid oil production and glandular mutations.

It has often been made to appear that the material universe has not needed a Creator. It is undeniable, however, that the universe exists. Four solutions of its origin may be proposed: first, that it is an illusion -contrary to the preceding statement; second, that it spontaneously arose out of nothing; third, that it had no origin but has existed eternally; fourth, that it was created.

The first proposed solution asserts that there is no problem to solve except the metaphysical one of human consciousness, which has occasionally itself been considered an illusion! The hypothesis of illusion has been lately revived in physical science by Sir James Jeans who states that from the concepts of modern physics 'the universe cannot admit of material representation, and the reason, I think, is that it has become a mere mental concept.⁶ Accordingly, one may say that illusory trains apparently filled with imaginary passengers" cross unreal rivers on immaterial bridges formed of mental concepts.

The second concept, that the world of matter and energy arose of itself out of nothing, is likewise too absurd a supposition for any consideration.

The third concept, that the universe existed eternally, has one element in common with the concept of creation: either inanimate matter with its incorporated energy, or a Personal Creator, is eternal. No greater intellectual difficulty exists in the one concept than in the other. But the laws of thermodynamics (heat) indicate that the universe is running down to a condition when all bodies will be at the same extremely low temperature and no energy will be available. Life would then be impossible. In infinite time this state of entropy would already have happened. The hot sun and stars, the earth with its wealth of life, are complete evidence that the origin of the universe has occurred in time, at a fixed point of time, and therefore the universe must have been created. A great First Cause, an eternal, all knowing and all powerful Creator must exist, and the universe is His handiwork.

The adjustments of the earth to life are far too numerous to be accounted for by chance. Firstly the earth is a sphere freely poised in space in daily rotation on its polar axis, giving the alternation of day and night, and in yearly revolution around the sun. 'These motions give stability to its orientation in space, and, 'the 23.5 degree axial of orbit, or ecliptic, about the sun results in long winter nights and long summer days alternating between both polar regions and causing seasonal variations in climate'.⁷

The habitable area of the earth is thus doubled and our Earth sustains a greater diversity of plant life than would be possible on a stationary globe.

Secondly, the atmosphere of life-supporting gases is sufficiently high (about 500 miles) and dense to blanket the earth against the deadly impact of twenty million meteors that daily enter it at speeds of about thirty miles per second. Among many other functions the atmosphere also maintains the temperature within safe limits for life; and carries the vital supply of fresh water-vapor far inland from the oceans to irrigate the earth, without which it would become a lifeless desert. Thus the oceans, with the atmosphere, are the balance-wheel of Nature.

Four remarkable properties of water. --- its power of absorbing vast quantities of oxygen at low temperatures, its maximum density at 4 degrees C. above freezing whereby lakes and rivers remain liquid, the lesser density of ice than water so that it remains on the surface, and the power of releasing great quantities of heat as it freezes, -preserve life in oceans, lakes and rivers throughout the long winters. The dry land is a stable platform for much terrestrial life. The soil provides the minerals which plant life assimilates and transforms into needful foods for animals. The presence of metals near the surface renders the arts of civilization possible. Surely Isaiah is right (45: 18 R.S.V.) in saying of God: 'He did not make it a chaos: He formed it to be inhabited.'

The diminutive size of the earth compared with the immensity of space is sometimes disparagingly referred to. If the earth were as small as the moon, i.e. one-fourth of its present diameter, 'the force of gravity (one sixth that of the earth) would fail to hold both atmosphere and water, and temperatures

would be fatally extreme. If double its present diameter, the enlarged earth would have four times its present surface and twice its force of gravity, the atmosphere would be dangerously reduced in height, and its pressure would be increased from 15 to 30 pounds per square inch, with serious repercussions upon life. The winter areas would be greatly increased and the regions of habitability would be seriously diminished. Communities of people would be isolated, travel and communication rendered difficult or almost impossible.

If our earth were of the size of the sun, but retaining its density, gravity would be 150 times as great, the atmosphere diminished to about four miles in height, evaporation of water rendered impossible and pressure increased to over a ton per square inch. A one-pound animal would weigh 150 pounds, and human beings would be reduced in size to that of, say, a squirrel. Intellectual life would be impossible to such creatures.

If the earth were removed to double its present distance from the sun, the heat received would be reduced to one-fourth its present amount, the orbital velocity would be only one-half, the winter season would be doubled in length and life would be frozen out. If its solar distance, were halved, the heat received would be four times as great, the orbital velocity would be doubled, seasons would be halved in length, if changes could even be effected, and the planet would be too parched to sustain life. In size and distance from the sun, and in orbital velocity; the earth is able to sustain life, so that mankind can enjoy physical, intellectual and spiritual life as it now prevails.

If in the origin of life there was no design, then living matter must have arisen by chance. Now chance, or probability, as it is termed, is a highly developed mathematical theory which applies to that vast range of objects of knowledge that are beyond absolute certainty. This theory puts us in possession of the soundest principles on which to discriminate truth from error, and to calculate the likelihood of the occurrence of any particular form of an event (pp.19-23).

A tendency to take human existence too much for granted is easily corrected by considering for a moment the proposition that since the earth is moving continuously at a velocity of one thousand miles per hour (and although our feet are in contact with the ground, we are all of us hanging with our heads down in space.) we ought to be cast off centrifugally into outer space, just like so many grains of sand flying off a rotating bicycle wheel. An alarming idea, isn't it! But, of course, nothing of the sort happens, because, fortunately for us, the gravitational force of the earth and the atmospheric pressure together hold our bodies safely in position on the earth's surface. This bilateral action keeps us clinging to the earth's surface no matter in which hemisphere we happen to be. The pressure which the atmosphere exerts upon the human body is the rather surprising figure of $15\frac{1}{2}$ lbs (about 8 kilograms) per square inch. But we do not feel the effects of such intense pressure, because the blood in our bodies exerts an equal pressure in the opposite direction.

On the basis of his own observation and studies, Newton came to the conclusion that all bodies exert a mutual attraction. But he had no answer to the question, 'Why do bodies attract one another'? He himself confessed to having failed to offer any explanation for this. On this point, A.N. Whitehead, the noted American mathematician and philosopher, says:

By admitting this fact, Newton has expressed a great philosophical truth, that is, if nature is inanimate, it can give no explanation to us, just as a dead man cannot narrate any incident. All rational and logical explanations are ultimately the expression of a purpose, whereas no ontology can be ascribed to a dead universe.⁸

To the words of Whitehead, we might well add the query that if the universe is not under the supervision of any intelligent mind, how is it then invested with such profound meaningfulness? The earth completes one rotation on its axis in twenty-four hours. In other words, it is rotating on its axis at a speed of one thousand miles per hour. Suppose its speed were reduced to two hundred miles per hour -which is quite possible, our days and nights would then be prolonged to ten times their present duration. The heat of the summer would become scorching and would reduce the entire vegetation of the planet to ashes during the day time, and whatever survived the heat would be shrivelled up by the severe cold during the excessively long nights. Just one change in one set of conditions would bring total devastation in its wake. Other changes could do the same. The sun, which is now our source of life, could become the most terrible scourge if, for example, the distance between the earth and the sun -approximately 95 million miles -were reduced by half, then -its 12 thousand degrees Fahrenheit surface temperature would cause this paper to burst into flames. Conversely, if the distance were doubled, the earth's surface would become too cold to allow any life to survive. A star ten thousand times bigger than the sun would keep the entire earth roasting hot, like an oven. The earth's inclination in space at an angle of 23 degrees is one of the greatest of marvels to man, because that is what causes our seasons, making the greater part of the earth habitable and providing a greater diversity of plant life. Had the earth's axis been perpendicular, there would have been perpetual darkness at the North and South Poles, the oceanic vapours would have travelled northwards and the earth's surface would have been covered in either glaciers or deserts -to describe but a few of the adverse effects. This would have rendered the survival of life on earth impossible. One can go on endlessly imagining different sets of physical circumstances which could have precluded or destroyed human existence. It is unthinkable then that the perfect conditions for man to come into existence on earth were simply self-generating and had no origin in divine inspiration.

If we think of what conditions were like at the time of the formation of the earth, it seems all the more miraculous that life could come into being at all. Isaac Asimov has painted a fearsome picture of the beginning of things. Correcting the earlier hypothesis in favour at the beginning of this century, he writes:

Currently, scientists are convinced the earth and the other planets did not form from the sun, but were formed of particles coming together at the same time that the sun itself was being formed. The earth was never at sun temperature, but it did grow quite warm through the energies of collision. of all the particles that formed it. It grew warm enough so that its relatively small mass could not hold an atmosphere or water vapor to begin with.

The solid body of the newly formed earth had, in other words, neither atmosphere nor ocean. Where, then, did they come from?

There existed water (and gases) in loose combination with the rocky substances making up the solid portion of the globe. As that solid portion packed together more and more tightly under the pull of gravity, its interior grew hotter and hotter. Water vapor and gas were forced out of combination with the rock and came fizzing from its substance.

The gaseous bubbles, forming and collecting, racked the baby earth with enormous quakes; escaping heat produced violent volcanic eruptions. For unnumbered years, liquid water did not fall from the sky; rather, water vapor whistled out of the crust and then condensed. The oceans formed from below, not from above.

What geologists mainly dispute now is the rate at which the oceans formed. Did the water vapor all fizz out within a billion years or less, so that the ocean has been its present size ever since life began? Or has the process been so slow that the ocean has been growing all through geologic time and is still growing?

Those who maintain the ocean formed early in the game and has been steady in size for a long time point out that the continents seem to be a permanent feature of the earth. They do not appear to have been much larger in the past, when the ocean was, supposedly, much smaller.

On the other hand, those who maintain the ocean has been growing steadily point out that volcanic eruptions even today pour quantities of water vapour into the air; water vapor derived from deep-lying rocks, not from the ocean. Also, there are sea mounts under the Pacific with flat tops that may have once been at ocean level but are now hundreds of feet below.⁹

Be that as it may, if the oceans had been deeper by just a few feet more, they would have absorbed all available carbon dioxide and oxygen, and no vegetation of any kind could have survived upon the earth's surface. If the air in the atmosphere had been less dense than it is at present, the twenty million meteors that daily enter it at speeds of about thirty miles per second, would be crashing down all over the earth, burning up all combustible matter and perforating the whole of the earth's surface. The heat alone of a meteor travelling 90 times faster than a bullet would be enough to annihilate so vulnerable a creature, as man. It is thanks to this atmospheric layer being of an appropriate density that mankind is safeguarded against these fiery showers of celestial debris. This density is also exactly right for solar actinic rays to reach the earth in, such proportions as will promote the growth of vegetation, destroy harmful bacteria, and make vitamins available which may be absorbed directly from the sunlight through the skin, or indirectly from edible matter through the digestive tract. How wonderful it is to have all these benefits in exact proportion to our requirements.

Take oxygen, for example. It is the source of life and is not obtainable from any source other than the atmosphere. But had it formed 50% of the atmosphere or more, instead of the present 21%, combustibility of all matter on the earth's surface would have been so high that even if just a single tree caught fire, whole forests would at once explode. Similarly, had the proportion of oxygen in the atmosphere been as low as 10%, life might conceivably have adjusted to this over the centuries, but it is unlikely that human civilization would have taken its present form. And if all of the free oxygen instead of only a part, had been absorbed by the matter present on the earth's surface, no animal life would have been possible at all.

Along with oxygen, hydrogen, carbon dioxide and carbon gases in their free form as well as in the form of different compounds are the most important ingredients of life the very foundations, in fact, on which our life rests. There being not even one chance in a hundred million that all these elements should have assembled in such favourable proportions on any other planet at anyone given time, we have to ask ourselves how it came about that such freely moving gases formed themselves into a compound and remained suspended in the atmosphere in exactly the right proportions to sustain life. As the noted physicist, Morton White puts it, 'Science has no explanation to offer for the facts, and to say it is accidental is to defy mathematics.'¹⁰

We have to concede that there is a formidable array of facts in this world, in the universe, which cannot be explained unless we admit the intervention of a superior mind. For instance, the density of ice is less than that of water, because, as it freezes, its volume increases in relation to its mass. It is because of

this that ice floats instead of sinking to the bottom of lakes and rivers and gradually forming a solid mass. On the surface of the water, it forms a layer of insulation to maintain the water below at a temperature above freezing point. Fish and other forms of marine life are thus permitted to survive throughout the winter, and, when spring comes, the ice melts rapidly. If water did not behave in this way, all of us in general, and people in cold countries in particular, would face severe calamities. Clearly this property of water is tremendously important to life.

In the world of arboriculture there are also numerous examples of nature aiding man. In the first two decades of the century, a chestnut blight, caused by the pathogen *Endothia*, spread rapidly across the forested regions of the U.S.A. It was widely felt that the holes it made in the forest canopy would never again be filled. This was highly regrettable because of the large number of useful things the chestnut tree yielded: high-grade, rot-resistant timber, wood pulp, tannin, nuts - not to speak of its shade. It also had the special advantage of being able to grow on mountain ridges with scanty soil as well as in rich fertile valleys. The unique position occupied by the American chestnut was unsurpassed by any other species and, until the arrival of *Endothia* from Asia around 1900, it had truly been king of the forest. Now it is almost extinct. But the holes in the forest canopy were eventually filled. Tulip-trees were already there, waiting for just such openings as would provide sufficient light for that shade-intolerant species to develop. Up till then, these trees had been minor denizens of the forest, only occasionally developing into valuable timber trees. Now, chestnut trees are hardly missed where dense groves of tulip trees have become established, these often growing as much as one inch in diameter and six feet in height per year; as well as their growth being rapid, their wood is of superior quality. Can we in all conscience say that the master plan of nature is merely a set of accidental circumstances?

In the present century too, a crisis of a different but more alarming nature developed in Australia when a certain species of cactus was grown on an extensive scale to provide fencing for the fields. Cressy Morrison writes:

The cactus had no insect enemies in Australia and soon began a prodigious growth. The march of the cactus persisted until it had covered an area approximately as great as England, crowded the inhabitants out of the towns and villages, and destroyed their farms, making cultivation impossible. No device which the people discovered could stop its spread. Australia was in danger of being overwhelmed by a silent, uncontrollable, advancing army of vegetation. The entomologists scoured the world and finally found an insect which lived exclusively on cactus, would eat nothing else, would breed freely, and which had no enemies in Australia. Here the animal conquered the vegetation and today the cactus pest has retreated, and with it all but a small protective residue of the insects, enough to hold the cactus in check forever.¹¹

Can such a great scheme of checks and balances as is found in Nature develop without any deliberate planning?

Consider the marvellous mathematical exactitude which is to be found in the universe. The behaviour even of inanimate matter is not in anyway haphazard: on the contrary, it "obeys" definite "natural laws". No matter in which corner of the world, at any given time the word "water" will invariably mean "a compound consisting of 11.1 percent of hydrogen and 88.9 percent of oxygen". Whenever a scientist in his laboratory heats a beaker filled with pure water until it boils, he knows, without using a thermometer, that the temperature of the boiling water is 100 degrees centigrade as long as the atmospheric pressure is 760 mm of mercury. If the pressure is less than 760 mm., less energy will have to be applied in the

form of heat to produce vapour or steam, so the boiling point will be correspondingly less than 100 degrees. Conversely, if the pressure is greater than 760 mm., the boiling point will be greater than 100 degrees. No matter how often this experiment is performed, by ascertaining the pressure, we can, with certainty, predict the boiling point of the water on each occasion. If there were no system and organization inherent in the working of water and energy, there would be no basis for scientific research and invention. Ufe in the laboratory, in the absence of immutable natural laws, would be a succession of quandaries; it would be a life fraught with uncertainty and doubt, rendering all scientific enquiry futile. Thomas Parks, a research chemist, writes:

One of the first things a freshman chemistry student learns is the periodicity or order found in the elements. This order has been variously described and classified, but we usually credit Mendeleev, the Russian chemist of the last century, with our periodic table. Not only did this arrangement provide a means of studying the known elements and their compounds, but it also gave impetus to the search for those elements which had not yet been discovered. Their very existence was postulated by vacant spaces in the orderly arrangement of the table.

Chemists today still use the periodic table to aid them in their study of reactions and to predict properties of unknown or new compounds. That they have been successful is sound testimony to the fact that a beautiful order exists in the inorganic world.

But the order we see around us is not a relentless omnipotence. It is tempered with beneficence -a testimony to the fact that the good and pleasure are as much a concern of Divine Intelligence as the immutable laws of Nature. Look around you at the exceptions and deviations that do, in fact, defy the laws of cold rationality. Take, for example, water. From its formula weight -18 -one would predict it would be a gas at ordinary temperatures and pressures. Ammonia -with a formula weight of 17 -is a gas at temperatures as low as minus 33° C at atmospheric pressure. Hydrogen sulphide, closely related to water by position in the periodic table and with a formula weight of 34, is a gas at temperatures down to minus 59°C. The fact that water exists as a liquid at all, at ordinary temperatures, is something to make one stop and think.¹²

“On August 11, 1999, there will be a solar eclipse that will be completely visible at Cornwall.”

This is not a prediction based simply on conjecture. We know from calculations based on our observations of the solar system's functioning that this eclipse is bound to occur. We tend to take it for granted that the innumerable stars we see in the sky, like pinpoints of lights, are part of a vast unchanging pattern. But these “pinpoints” of light are actually colossal balls suspended in the vastness of space and, since time immemorial, have been moving in the same fixed orbits with such perfect precision that their paths (and, more recently, that of artificial satellites) can be accurately predicted at any given moment. Right from a tiny drop of water to the greatest imaginable star, the whole range of natural phenomena evinces a wonderful system and organization. The behaviour of such objects is uniform to such a degree that we have been able to formulate laws on this basis.

Newton's theory of gravitation explained the revolution of astronomical spheres. In accordance with this, AC. Adams and U. Leverrier found the basis on which, without observation, they could successfully predict the existence of a hitherto undiscovered planet. As foretold by the two astronomers, when on a night in September 1846, the telescope at the Berlin observatory was turned towards the point indicated by their calculations, it was observed that such a planet did, in fact, exist in the solar system. This is the

planet we now call Neptune.

Isn't it preposterous to believe that this mathematical exactness in the universe developed on its own? An aspect of the wisdom and significance found in the universe which is worth pondering upon is that it has such potentialities as may be exploited by man whenever the need arises. For instance, let us take nitrogen. Human beings and animals would die of starvation if our diet did not contain nitrogen compound. Each puff of air may contain 78% nitrogen, but no nutritive plant will grow without an interaction between nitrogen and the soil taking place, and there are only two ways that soluble nitrogen can be mixed with the soil to fertilize it. One of them is by the typical bacterial process. Certain bacteria, which live in the roots of leguminous plants such as peas, beans, alfalfa and peanuts, assimilate atmospheric nitrogen and convert it into a compound of nitrogen. When the plant dries up, some part of this compound remains stored in the soil. Another form of fixed nitrogen, nitric acid, occurs naturally in the atmosphere when lightning discharges. The action of electrical energy on the atmosphere, which dissociates nitrogen and oxygen molecules, allows the free atoms to form nitric oxide and nitrogen dioxide, and this nitrogen compound is brought down by rainfall to our fields. The amount of nitrate obtained from nitrogen by this means, according to one estimate, is five pounds per acre of soil, in each year. This quantity is equal to 30 pounds of sodium nitrate.¹³

Both these sources have proved inadequate in meeting the nitrogen requirements of man, for fields which are repeatedly cultivated over long periods eventually run short of nitrogen. Hence the practice of crop rotation by farmers. Owing to an increase in population and intensive cultivation at the beginning of the present century, a general deficiency of nitrogen compound began to make itself felt and man appeared to be heading for a prolonged period of famine. It is strangely significant that, at such a critical time, we discovered the method of artificially preparing this compound from the air. One of the several different essays in this field entailed the artificial causation of thunder and lightning in the atmosphere. A force of about 300,000 horsepower was applied to cause this phenomenon, and, as had been estimated, a small amount of nitrogen was thus produced. Man, with his God-given wisdom, had marched one step forward. It was ten thousand years after the dawn of human history that methods had been invented to convert nitrogen gas into fertilizers. This invention placed man in a position to produce this essential part of his nutrition himself, without which, he would surely have died of starvation. It is inspiring to think that, for the first time, throughout the entire history of the earth, man had discovered a solution to the problem of food scarcity at the exact point in time when it was about to cause ultimate disaster to the human species. Many other significant aspects of divine wisdom and purpose are immanent in the universe. All that has so far been revealed by scientific enquiry is quite imaginably nothing in comparison to the facts which still await discovery. Be that as it may, whatever little, comparatively speaking, man has discovered of nature is still too vast in scope to be covered by the present volume. In fact, any attempt on the part of man to list and describe divine blessings would be inadequate. No matter how comprehensive the description may be, the moment our tongues and pens stop moving, we begin to feel that all we have done is delimit rather than describe. Indeed, no account of divine wisdom as manifested in the universe would be complete, even if all knowable facts were to come to light and all human beings, equipped with all of the resources available in the world were to join together in describing them.

And if all the trees in the earth were pens, and the sea, with seven more seas to replenish it, were ink, the writings of Allah's words could never be exhausted. Mighty is God and wise.¹⁴

Anyone who has attempted to make an exhaustive study of the universe will admit that there is no

element of exaggeration in these words from the divine scripture. They are just a plain, unembroidered expression of the truth.

In the last few pages, we have referred to the wonderful organization, meaningfulness and extraordinary wisdom which manifest themselves in the universe. The antagonists of religion will no doubt concede that these are facts, but they will insist on a different interpretation of their significance. They do not glimpse even fleetingly, an Organizer and Sustainer in this universe. On the contrary, they hold that life on earth and the existence of the universe are simply chance occurrences. As T.R Huxley puts it:

Six monkeys, set to strum unintelligently on typewriters for millions of millions of years, would be bound in time to write all books in the British Museum. If we examined the last page, which a particular monkey had typed, and found that it had chanced, in its blind strumming, to type a Shakespeare Sonnet, we should rightly regard the occurrence as a remarkable accident, but if we looked through all the millions of papers the monkey had turned out in untold millions of years, we might be sure of finding a Shakespeare Sonnet somewhere amongst them, the product of the blind play of Chance. In the same way, millions of millions of stars wandering blindly through space for millions of millions of years are bound to meet with every kind of accident; a limited number are bound to meet with that special kind of accident which calls planetary systems into being.¹⁵

But one of the greatest of our contemporary physicists, Sir Fred Hoyle, asks if it is at all possible that chance could operate on such a large scale, and answers emphatically in the negative. As he puts it in his book, *The Intelligent Universe*:

‘The Universe, as observed by astronomers, would not be large enough to hold the monkeys needed to write even one scene from Shakespeare, or to hold their typewriters, and certainly not the wastepaper baskets needed for the rubbish they would type.’

None of our sciences up till now has unearthed any such “chance occurrence” as could have accounted for such a great, meaningful and permanent phenomenon as the universe. Of course, there are certain random happenings which do explain certain aspects of nature. For instance, a gust of wind sometimes carries away pollen grains from a red-coloured rose and, with them, pollinates the stigma of a white-coloured rose. This cross pollination produces pink-coloured roses. But such an incident is only a minor event in the entire existence of the rose. Its continued presence under specific conditions in this universe, and its wonderful adaptation to the whole physical system of the rest of the world, can never be fully understood simply by ascribing these things to a random flow of air. The term ‘chance occurrence’ expresses one facet of the truth, but as an explanation for the existence of the universe and its processes, it is patently absurd. According to Professor Edwin Conklin, a biologist at Princeton University, The probability of life originating from accident is comparable to the probability of the Unabridged Dictionary resulting from an explosion in a printing shop.¹⁶

It is said that an explanation for the existence and working of the universe with reference to ‘chance’ is not just a haphazard guess but, in the words of Sir James Jeans, is based on ‘purely mathematical laws of chance.’ (*The Mysterious Universe*, p.3) An author writes: ‘Now chance, or probability as it is termed, is a highly developed mathematical theory which is applied to that vast range of objects of knowledge that are beyond absolute certainty. This theory puts us in possession of the soundest principles on which to discriminate truth from error, and to calculate the likelihood of the occurrence of any particular form of an event.’¹⁷

Even if we take it for granted that matter, in a crude form spontaneously originated in the universe, and that a chain of voluntary action and reaction is responsible for creation, (although such an assumption is baseless) we have no adequate explanation for the existence of the universe. Unfortunately for the antagonists of religion, the same mathematics that provides them with the golden key of the Law of Chance, rules out the possibility of the Law of Chance having been the cause of the present universe. for, in calculating the age and dimensions of our world, Science shows that Chance falls far short of explaining the facts. In a chapter on the uniqueness of our world, from his book, *Man Does Not Stand Alone*, Cressy Morrison offers a telling illustration of this point:

Suppose you take ten pennies and mark them from 1 to 10. Put them in your pocket and give them a good shake. Now try to draw them out in sequence from 1 to 10, putting each coin back in your pocket after each draw.

Your chance of drawing No.1 is 1 to 10. Your chance of drawing 1 and 2 in succession 1 in 100. Your chance of drawing 1, 2 and 3 in succession would be one in a thousand. Your chance of drawing 1, 2, 3, and 4 in succession would be one in 10,000 and so on, until your chance of drawing from No.1 to No. 10 in succession would reach the unbelievable figure of one chance in 10 billion. The object in dealing with so simple a problem is to show how enormously figures multiply against chance.

Sir Fred Hoyle similarly dismisses the notion that life could have started by random processes:

Imagine a blindfolded person trying to solve the Rubik cube. The chance against achieving perfect colour matching is about 50,000,000,000,000,000,000, to 1. These odds are roughly the same as those against just one of our body's 200,000 proteins having evolved randomly, by chance.

Now, just imagine, if life as we know it had come into existence by a stroke of chance, how much time would it have taken? To quote the biophysicist, Frank Allen :

Proteins are the essential constituents of all living cells, and they consist of the five elements, carbon, hydrogen, nitrogen, oxygen and sulphur, with possibly 40,000 atoms in the ponderous molecule. As there are 92 chemical elements in Nature, all distributed at random, the chance that these five elements may come together to form the molecule, the quantity of matter that must be continually shaken up, and the length of time necessary to finish the task, can all be calculated. A Swiss mathematician, 18 Charles Eugene Guye, has made the computation and finds that the odds against such an occurrence are 10160 to 1, or only one chance in 10160, that is 10 multiplied by itself 160 times, a number far too large to be expressed in words. The amount of matter to be shaken together to produce a single molecule of protein would be millions of times greater than that in the whole universe. For it to occur on the earth alone would require many, almost endless billions (10243) of years.

Proteins are made from long chains called amino-acids. The way those are put together matters enormously. If in the Wrong way, they will not sustain life and may be poisons. Professor J.B. Leathes (England) has calculated that the links in the chain of quite a simple protein could be put together in millions of ways (1048). It is impossible for all these chances to have coincided to build one molecule of protein.

But proteins as chemicals are without life. It is only when the mysterious life comes into them that they live. Only Infinite Mind, that is God, could have foreseen that such a molecule could be the abode of life, could have constructed it, and made it live.¹⁹

Science, in attempting to calculate the age of the whole universe, has placed the figure at 50 billion years. Even such a prolonged duration is too short for the necessary proteinous molecule to have come into existence in a random fashion. When one applies the laws of chance to the probability of an event occurring in Nature, such as the formation of a single protein molecule from the elements, even if we allow three billion years for the age of the earth or more, there isn't enough time for the event to occur.²⁰

There are several ways in which the age of the earth may be calculated from the point in time at which it solidified. The best of all these methods is based on the physical changes in radioactive elements. Because of the steady emission or decay of their electric particles, they are gradually transformed into radio-inactive elements, the transformation of uranium into lead being of special interest to us. It has been established that this rate of transformation remains constant irrespective of extremely high temperatures or intense pressures. In this way we can calculate for how long the process of uranium disintegration has been at work beneath any given rock by examining the lead formed from it. And since uranium has from existed beneath the layers of rock on the earth's surface right from the time of its solidification, we can calculate from its disintegration rate the exact point in time when the rock solidified.

In his book, *Human Destiny*, Le Comte Du Nouy has made an excellent, detailed analysis of this problem:

It is impossible because of the tremendous complexity of the question to lay down the basis for a calculation which would enable one to establish the probability of the spontaneous appearance of life on earth (p.33).

The volume of the substance necessary for such a probability to take place is beyond all imagination. It would be that of a sphere with a radius so great that light would take 1082 years to cover this distance. The volume is incomparably greater than that of the whole universe including the farthest galaxies, whose light takes only 2×10^6 (two million) years to reach us. In brief, we would have to imagine a volume more than one sextillion, sextillion, sextillion, times greater than the Einsteinian universe (p.34).

The probability for a single molecule of high dissymmetry to be formed by the action of chance and normal thermal agitation remains practically nill. Indeed, if we suppose 500 trillion shakings per second (5×10^{14}), which corresponds to the order of magnitude of light frequency (wave lengths comprised between 0.4 and 0.8 microns), we find that the time needed to form, on an average, one such molecule (degree of dissymmetry 0.9) in a material volume equal to that of our terrestrial globe is about 10243 billions of years (1 followed by 243 zeros) (p.34).

But we must not forget that the earth has only existed for *two billion years* and that life appeared about one billion years ago, as soon as the earth had cooled (1×10^9 years) (p.34).

Life itself is not even in question but merely one of the substances which constitute living beings. Now, one molecule is of no use. Hundreds of millions of *identical* ones are necessary. We would need much greater figures to "explain", the appearance of a series of similar molecules, the improbability increasing considerably, as we have seen for each new molecule (compound probability), and for each series of identical throws.

If the probability of appearance of a living cell could be expressed mathematically the preceding figures would seem negligible. The problem was deliberately simplified in order to increase the probabilities (p.35).

Events which, even when we admit very numerous experiments, reactions, or shakings per second, need an infinitely longer time than the estimated duration of the earth in order to have one chance, on an average, to manifest themselves can, it would seem, be considered as impossible in the human sense (p.36).

It is totally impossible to account scientifically for all phenomena pertaining to life, its development and progressive evolution, and that, unless the foundations of modern science are overthrown, they are unexplainable.

We are faced by a hiatus in our knowledge. There is a gap between living and non-living matter which we have not been able to bridge (p. 36).

The laws of chance cannot take into account or explain the fact that the properties of a cell are born out of the coordination of complexity and not out of the chaotic complexity of a mixture of gases. This transmissible, hereditary, continuous coordination entirely escapes our laws of chance.

Rare fluctuations do not explain qualitative facts, they only enable us to conceive that they are not impossible qualitatively (p. 37).

Such calculations show that at least 1400 million years have elapsed since the process of rock-solidification took place. These estimates are based on a study of those rocks which are known to be the oldest on our planet. I.W. Sullivan puts the earth's age at two thousand million years - a moderate estimate by his own account. When a period of trillions and trillions of years would be required for a single non-living proteinous molecule to develop in a purely random way, we have to ask ourselves how more than ten lakh species of animals with fully developed bodies, and more than two lakh species of plants could have originated upon the surface of the earth within the relatively short period of two thousand million years. And how was it that innumerable members of each species reproduced themselves and became widespread throughout the land and the oceans? Is it really conceivable that within such a short span of time, a superior creature like man could have evolved from inferior living organisms, and all just by the merest chance?

The theory of evolution is based upon a certain incidence of chance mutations -accidental variations - among the different species. But even supposing rare mutations conferring a 1% advantage did occasionally occur, just how rapidly could they be accumulated in a species? Patan, in his *Mathematical Analysis of the Evolution Theory*, has shown that it would take about 1,000,000 generation to effect a population breeding true for this new mutation. Certainly, even granting the immense periods of time postulated by geologists, it is difficult to see how such a relatively modern animal as the horse would have evolved from its presumed five-toed dog-like ancestor since the relatively recent Eocene times.!

This detailed analysis has been made here simply to expose the absurdity of the "chance-occurrence" theory. Neither an atom nor a molecule, nor the mind Which applies itself to how the universe originated, could have come into existence by pure "chance". No matter how long a period may be presumed for it, the theory of chance occurrence is impossible, not only from the mathematical point of view, but also from the standpoint of common sense. As a theory, it just does not carry any weight.

An American physiologist, Dr. Andrew Conway Ivy writes: "It is many times more absurd to believe that this causal chain came from nothing, and was due to chance, than it would be to believe that you could get a map of the world by spilling a glass of water on the floor."²²

It may well be asked where the floor, the gravitational force of the earth, the water and the glass came from in order to bring about this 'chance occurrence.'

Haeckel, a noted biologist, claimed, "Give me air, water, chemical elements and time and I will make a man." This claim obviously implied that God was not necessary for such a feat. But by admitting the prior presence of the man -himself -and the material conditions essential for the success of his project, he unwittingly demonstrated the vacuity of such a notion.

Dr. Morrison has rightly said: 'While asserting this, Haeckel overlooked the problem of genes and life itself. To bring a man into existence, first of all he would have to obtain the invisible atoms. Then, after putting them in a specific order, he would have to construct a gene and import life to it. Even then, the probability of its chance creation is one in crores. But even supposing that he succeeded, he could not call it an 'accident'. On the contrary, he would regard it as the outcome of his own intelligence.'²³

In the following statement of belief, George Earl Davis, an American physicist, makes perhaps the best summing up of the situation: 'If a universe could create itself, then it would embody in itself the powers of a Creator, a God, and we should be forced to conclude that the universe itself is a God. Thus the existence of a God would be admitted, but in the peculiar form of a God that is both supernatural and material. I choose to conceive of a God who has created a material universe not identical with Himself but dominated and permeated by Himself.'²⁴

Note :

- 1) *je pense, donc je suis."
- 2) John Stuan Mill, Autobiography (New York, Columbia University Press, 1960), p. 30.
- 3) Evidence of God, pp.50-51.
- 4) The Mysterious Universe, p. 133
- 5) Sir Arthur Stanley Eddington (1882-1944), noted British physicist and astronomer.
- 6) The Mysterious Universe, p. 169.
- 7) Encyclopaedia Britannica, Vol. I, p. 954.
- 8) The Age of Analysis, p. 85.
- 9) Please Explain, pp. 64.65.
- 10) The Age of Analysis, p. 33. 1 The Age of Analysis, p. 33.
- 11) Man Does Not Stand Alone, pp. 78-79.
- 12) Evidence of God, pp; 74-75.
- 13) Lyon, Buckman and Brady, The Nature and Properties of Soils.
- 14) Quran, 31: 27.
- 15) Quoted by Sir James, The Mysterious Universe, pp. 3-4.
- 16) The Evidence of God, p. 174
- 17) Libid., p. 23
- 18) Quoted by V.H. Mottram in the organ of the British Broadcasting Corporation, April 22, 1948.
- 19) Evidence of God, pp. 23-24.
- 20) The Evidence of God, p. 160.
- 21) The Evidence of God, p. 117.
- 22) Bid., p. 239.
- 23) Man Does not stand alone, p. 87.
- 24) The Evidence of God, p. 71

To be continued...

THE SECOND SURHA
ALBAQARH (THE COW)
verse 37 to verse 55

37) Thereupon Adam received words [of guidance] from his Sustainer, and He accepted his repentance : fro verily He alone is the Acceptor of Repentance, the Dispenser of Grace.

(38) [For although] We did say, "Down with you all from this [state] " there shall, none the less, most certainly come unto you guidance from Me: and those who follow My guidance need have no fear. and neither shall they grieve;

(39) but those who are bent on denying the truth and giving the lie to Our messages-they are destined for the fire, and therein shall they abide.

(40) O CHILDREN Of Israel!³¹ Remember those blessings of Mine with which I graced you, and fulfil your promise unto you; and of Me, of Me stand in awe!

(41) Believe in that which I have [now] bestowed from on high, confirming the truth already in your possession, and be not foremost among those who deny its truth; and do not barter away My messages for a trifling gain;³² and of Me, of Me be conscious!

(42) And do not overlay the truth with falsehood, and do not knowingly suppress the truth;³³ (43) and be constant in prayer, and spend in charity,³⁴ and bow down in prayer with all who thus bow down.

(44) Do you bid other people to be pious, the while you forget your own selves-and yet you recite the divine writ? Will you not, then use your reason?

(45) And seek aid in steadfast patience and prayer: and this, indeed, is a hard thing for all but the humble in spirit, (46) who know with certainty that they shall meet their Sustainer and that unto Him they shall return.

(47) O children of Israel! Remember those blessings of Mine with which I graced you, and how I favoured you above all other people;

(48) and remain conscious of [the coming of] a Day when no human being shall in the least avail another, nor shall intercession be accepted from any of them, nor ransom taken from them,³⁵ and none shall be succoured.

(49) And [remember the time] when We saved you from Pharaoh's people, who afflicted you with cruel suffering, slaughtering your sons and sparing [only] your women³⁶ - which was an awesome trial from your Sustainer;

(50) and when We cleft the sea before you, and thus seved you and caused Pharaoh's people to drown before your very eyes;

(51) and when We appointed for Moses forty nights [on Mount Sinai], and in his absence you took to worshipping the [golden] calf and thus became evildoers:

(52) yet, even after that, We blotted out this your sin, so that you might have cause to be grateful.³⁷

(53) And [remember the time] when We vouchsafed unto Moses the divine writ - and [thus] a standard by which to discern the true form the false³⁸ - so that you might be guided aright;

(54) and when Moses said unto his people: "O my people! Verily, you have sinned against yourselves by worshipping the calf; turn, then, in repentance to your Maker and mortify yourselves; this will be the best for you in your Maker's sight.

And thereupon He accepted your repentance; for behold, He alone is the Acceptor of Repentance, the Dispenser of Grace.

(55) And [remember] when you said, "O Moses, indeed we shall not believe thee unto we see God face to face!" - whereupon the thunderbolt of punishment⁴⁰ overtook you before your very eyes

31 This passage connects directly with the preceding passages in that it refers to the continuous guidance vouchsafed to man through divine revelation. The reference to the children of Israel at this point, as in so many other places in the Quran, arises from the fact that their religious beliefs represented an earlier phase of the monotheistic concept which culminates in the revelation of the Quran.

32 A reference to the persistent Jewish belief that they alone among all nations have been graced by divine revelation. The "trifling gain" is their conviction that they are "God's chosen people" - a claim which the Quran consistently refutes.

33) By "overlaying the truth with falsehood" is meant the corrupting of the Biblical text, of which the Quran frequently accuses the Jews (and which has since been established by objective textual criticism). While the "Suppression of the truth" refers to their disregard or deliberately false interpretation of the words of Moses in the Biblical passage, "The Lord thy God will raise up unto thee a prophet from the midst of thee, of thy brethren like unto me: unto him ye shall hearken (Deuteronomy xviii. 15) and the words attributed to God Himself, I will raise them up a prophet from among thy brethren like unto thee and will put My words in his mouth (Deuteronomy xviii. 18). The 'brethren of the children of Israel' are obviously the Arabs, and particularly the *Musta'ribah* ("Arabianized") group among them, which traces its descent to Ishmael and Abraham: and since it is to this group that the Arabian Prophet's own tribe, the Quraysh, belonged, the above Biblical passages must be taken as referring to his advent.

34.) In Islamic Law *zākāh* denotes an obligatory tax, incumbent on Muslims which is meant to purify a person's capital and income from the taint of selfishness (hence the name). The proceeds of this tax are to be spent mainly but not exclusively, on the poor. Whenever therefore, this term bears the above legal implication, I translate it as "the purifying dues" since, however, in this verse it refers to the children of Israel and obviously implies only acts of charity towards the poor, it is more appropriate to translate it as "almsgiving" or charity. I have also adopted this latter rendering in all instances where the term *zakāh* though relating to Muslims, does not apply specifically to the obligatory tax as such (e.g., in 73:20 where this term appears for the first time in the chronology of revelation).

35) The "taking of ransom (*adl*)" is an obvious allusion to the Christian doctrine of vicarious redemption as well as to the Jewish idea that "the chosen people" - as the Jews considered themselves - would be exempt from punishment on the Day of Judgment. Both these ideas are categorically refuted in the Quran.

36) See Exodus 15-16, 22

37) The story of the golden calf is dealt with at greater length in 7: 148ff and 20: 85ff. Regarding the crossing of the Red Sea, to which verse 50 above alludes, see 20: 77-78 and 26: 63-66, as well as the corresponding notes. The forty nights (and days) which Moses spent on Mount Sinai are mentioned again in 7: 142.

38) Muhammad Abduh amplifies the above interpretation of *al-furqan* (adopted by Tabari, Zamakhshari and other great commentators) by maintaining that it applies also to "human reason which enables us to distinguish the true from the false" (Manār III 160), apparently basing this wider interpretation on 8: 41 where the battle of Badr is described as *yawm al-furqan* ("the day on which the true was distinguished from the false") while the term *furqān* is often used in the Quran to describe one or another of the revealed scriptures, and particularly the Quran itself, it has undoubtedly also the connotation pointed out by Abduh: for instance in 8: 29, where it clearly refers to the faculty of moral valuation which distinguishes every human being who is truly conscious of God.

39.) Lit., "kill yourselves" or according to some commentators, "kill one another." This literal interpretation (probably based on the Biblical account in Exodus xxxii, 26-28) is not however, convincing in view of the immediately preceding call to repentance and the subsequent statement that this repentance was accepted by God. I incline, therefore, to the interpretation given by Abd al-Jabbar (quoted by Rāzi in his commentary on this verse) to the effect that the expression "kill yourselves" is used here in a metaphorical sense (*majāzan*) i.e., "mortify yourselves".

40) The Quran does not state what form this "thunderbolt of punishment" (*as-sāiqah*) took. The lexicographers give various interpretations to this word, but all agree on the element of vehemence and suddenness inherent in it (See Lane IV, 1960).